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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Pierre Fayet

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EXAMINER

CHEN, KEATH T

ART UNIT

PAPER NUMBER

1762

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<p align="center">Office Action Summary</p>	Application No. 10/529,533	Applicant(s) FAYET ET AL.	
	Examiner Keath T. Chen	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>03/29/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Include the subject matter of claim 1, which is the fact that a parallel arrangement is claimed but not mentioned in the specification. No new matter may be entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1, lines 11-13, "the magnetron faces being arranged beside each other in parallel and at a distance from the supporting and transporting means" is not described in the specification.

For example, [0007] of the specification, "The magnetron electrodes ... length extending parallel to the drum axis and their width extending substantially tangentially to the drum" does not support the limitation of claim 1.

See MPEP 2173.03.

Claim Objections

3. Claim 8 is objected to because of the following informalities: "gas supplied to the space" while claim 1 already established antecedent basis for gas. Appropriate correction is required.

Claim Interpretation

4. Claim 1 tries to means for under 35 U.S.C. 112 paragraph 6 by the it states "...means for maintaining a constant reduced pressure ..." and "means for supplying a process gas". However in Fig. 1 and [0018] in specification no structure is provided to fulfill the requirements of the statute therefore the claim is not being view as a means for claim.

Claim 10, "means for circulating a cooling medium through the channels". However in Fig. 5 and [0026] in specification no structure is provided to fulfill the requirements of the statute therefore the claim is not being view as a means for claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohtake et al (US 5339584, hereafter '584).

'584 teaches all limitations of claim 1:

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A device (Fig. 17) for treating a web material (#3d) in a plasma enhanced process, the device comprising a vacuum chamber (not shown, col. 9, last line) with means for maintaining a constant reduced pressure within the chamber (col. 10, lines 2-4) and, arranged within the chamber, a web supporting and transporting means (#51, 52a-e, #57, and #54 and #56 which support the web #3d), a magnetron means facing the web (#55 and #48, col. 10, lines 24-35 and also col. 9, lines 67-68) supported and transported by the supporting and transporting means and a gas supply means for supplying a process gas or process gas mixture to a space (not shown in Fig. 17, col. 10, lines 4-6 requires a gas supply means) between the supporting and transporting means and the magnetron means (gas will naturally flow to this space), wherein the magnetron means comprises a plurality of independent magnetron electrodes with rectangular magnetron faces (rectangular shape is implied for uniform coating of web), each magnetron electrode (#55 and #48) being powered with an alternating voltage (RF is alternating voltage) by its own power supply means (col. 10, lines 24-35), and the magnetron faces being arranged beside each other in parallel (as shown in Fig. 17) and at a distance from the supporting and transporting means, and wherein the supporting and transporting means is electrically grounded (earth member #54 and #56, col. 10, line 28 and 33).

'584 further teaches all limitations of claim 2:

The supporting and transporting means is a rotating drum (#51), the magnetron faces having a length direction (perpendicular to the page) and a width direction (bottom line of #55 and #48) and being arranged such that the magnetron face length direction

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is parallel to an axis of the drum (perpendicular to the page) and the magnetron face width direction is substantially tangentially to a circumferential surface of the drum (the top and bottom circumferential surfaces of the drum are horizontal).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over '584, further in view of Enjoji (Patent abstract of JP 63112441, hereafter '441).

'584 teaches all limitations of claim 1, as discussed above. '584 is silent on the gas supply position.

'584 does not explicitly teach the limitation of claims 3 and 8:

Claim 3: the gas supply means comprises gas supply lines extending between adjacent magnetron faces.

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Claim 8: (the) gas supplied to the space between magnetron faces and the supporting and transporting means is allowed to be removed in an axial direction and/or between adjacent magnetron faces.

'441 is an analogous art in the field of thin film roll coating using magnetron (English abstract). '441 teaches to place gas supply (#10) in between two magnetrons (#5 and #6) for the purpose of supplying plasma gas for the deposition.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '441 with '584. Specifically, to have positioned the gas supply lines in between the magnetrons for the purpose of supplying plasma gas, with reasonable expectation of success. The gas would have been removed in the axial direction and between adjacent magnetron faces.

'584 teaches the limitation of claim 3 and 8 except for the position of the gas feed lines. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, U.S. 327, 65 USPQ 297 (1945).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over '584 and '441, further in view of Yamamoto et al. (US 20010010207, hereafter '207).

'584 and '441, together, teach all limitations of claim 3, as discussed above.

'584 and '441, together does not explicitly teaches the limitation of claim 5:

The supply lines comprise rows of gas outlets arranged for gas injection either substantially perpendicular or substantially parallel to the magnetron faces.

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'207 is an analogous art in the field of plasma process apparatus (field of the invention) particularly in rectangular substrate ([0019], lines 3-5). '207 teaches to place row of gas supply (#6a Fig. 3, see also Fig. 1) in between two microwave introduction window (#4) and facing the substrate (perpendicular to the substrate) for the purpose of uniformly supplying plasma gas ([0085]).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '207 with '441 and '584. Specifically, to have incorporate rows of gas outlet in between the magnetrons (similar in function as the microwave) for the purpose of uniformly supplying plasma gas, with reasonable expectation of success.

8. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over '584, further in view of Yamanishi (US 5322605, hereafter '605).

'584 teaches all limitations of claim 1, as discussed above. '584 is silent on the gas supply position.

'584 does not explicitly teaches the limitations of claims 4 and 6:

Claim 4: The gas supply means comprises gas supply lines extending within the magnetron face and parallel to the length direction of the magnetron face.

Claim 6: wall elements extending along the longitudinal edges of the magnetron faces and towards the supporting and transporting means.

'605 is an analogous art in the field of thin film deposition on substrate (col. 4, lines 43-46), particularly in solving magnetron discharge lowering formation rate problem (col. 2, lines 52-56). '605 provides a gas supply line (Fig. 1, #14 and #19)

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within magnetron face; having a row of gas outlets (#19) parallel to the magnetron faces; and having wall element perpendicular to the magnetron faces (#7, the side covering the holes); for the purpose of solving the formation rate problem.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '605 with '584. Specifically, to have positioned the gas supply line within the magnetron design from Fig. 1 of '605 to the magnetron (#55 and #48) in Fig. 17 of '584, for the purpose of improving formation rate performance, with a reasonable expectation of success.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over '584 and '605, further in view of Tokai et al. (DE 3735162, hereafter '162).

'584 and '605, together, teach all limitations of claim 4, as discussed above. '584 recognizes using PECVD with high frequency magnetron cathode is an efficient method for its purpose (col. 9, lines 39-44).

'584 and '605, together, do not teach the limitation of claim 7:

The magnetron electrode (6) constitutes a twin magnetron.

'162 is an analogous art in the field of thin film deposition on films (English translation, first paragraph), particularly in planar magnetron to solve uniformity problem (3rd paragraph). '162 provides a twin magnetron (Fig. 7) with large dimension for uniformly coating thin film (page 3, 5th paragraph).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '162 with '605 and '584. Specifically, to have incorporated the twin magnetron design from Fig. 17 of '162 to the magnetron (#55 and

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#48) in Fig. 17 of '584, further provide the gas supply line within the magnetron as taught from '605, for the purpose of uniformity, particularly for larger dimension coatings, with a reasonable expectation of success.

10. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over '584, further in view of Bobbio et al. (US 4738761, hereafter '761).

'584 teaches all limitations of claim 1, as discussed above. '584 is silent on the magnetron structure.

'584 does not explicitly teach the limitations of claims 9 and 10:

Claim 9: The magnetron faces comprise electrode pieces of a non magnetic material extending over the magnetic poles constituting the magnetron face.

Claim 10: The electrode pieces of the magnetron faces comprise channels that are connected to a means for circulating a cooling medium through the channels.

'761 is an analogous art in the field of magnetron gas discharge processing (abstract, '584, col. 9, lines 38-44). '761 provides a cathode assembly (Figs. 2-4) with non magnetic aluminum cathode (col. 3, lines 29-31) and cooling channels within cathode (#14, #15, col. 3, lines 41-45); and the cathode being extending over the magnetic poles (col. 4, lines 20-28); for the purpose of reducing the ion energy to minimize damage (col. 4, lines 41-44 and col. 2, lines 28-29).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '761 with '584. Specifically, to have adopted the magnetron design from Figs. 2-4 of '761 to the magnetron (#55 and #48) in Fig. 17

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of '584, for the purpose of minimizing damage, with a reasonable expectation of success.

11. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over '584, further in view of Fu et al. (US 6306265, hereafter '265).

'584 teaches all limitations of claim 1, as discussed above. '584 is silent on the magnetron structure.

'584 does not explicitly teach the limitations of claims 11 and 12:

Claim 11: The magnetron electrodes constitute magnetrons of an unbalanced type.

Claim 12: The magnetron faces comprise permanent magnetic central and peripheral poles, the central pole having a magnetic strength that is about half of a magnetic strength of the peripheral pole.

'265 is an analogous art in the field of thin film deposition (title), particular in improving sputtering magnetron design (col. 4, lines 31). '265 provides an unbalanced magnetron design (Fig. 7 and Fig. 17) with inner poles having magnetic flux less than peripheral poles by a factor of 2 (col. 11, lines 54-58), for the purpose of supporting a higher-density plasma deep into the processing area (col. 11, line 60 to col. 12, line 11).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '265 with '584. Specifically, to have adopted the magnetron design from Figs. 7 and 17 of '265 to the magnetron (#55 and #48) in Fig. 17 of '584, for the purpose of supporting a higher-density plasma deep into the processing area, with a reasonable expectation of success.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6168698 and 20020158616 are cited for alternative definition of twin magnetron.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keath T. Chen whose telephone number is 571-270-1870. The examiner can normally be reached on M-F, 8:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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KC

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